Technical Report 1001

The Impact of Leader Competence and Platoon Conditions on Platoon Performance in Simulated Combat Exercises

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U.S. Army Research Institute

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13. ABSTRACT (Maximum 200 words)

This research concerned the quality of military leadership when, at the home post or station of a unit's assignment, leaders prepared their units for deployment to combat. Hypotheses were drawn from cognitive resources theory (CRT) to examine the influence of leader-boss stress and member support on a leader's use of personal resources in simulated combat exercises. Evidence supported predictions that member support influences the relationship between leadership competence and unit performance. The relationship among leader competence, leader experience, and leader-boss stress did not support CRT. Results are discussed with respect to CRT and other relevant leadership theory. Findings highlight the importance of attending to group conditions when planning intervention to enhance the effectiveness of unit leadership.

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Technical Report 1001

The Impact of Leader Competence and Platoon Conditions on Platoon Performance in Simulated Combat Exercises

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Education and Training

A primary mission of the Leadership and Organizational Change Technical Area of the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) is to enhance small unit readiness and performance through research to improve leadership, cohesion, and motivation. The research described in this report is part of a project focusing on the impact of factors at a unit's home station on subsequent performance of the unit at the U.S. Army Combat Training Centers (CTCs). This research project, originally titled "Determinants of Small Unit Performance," is now part of ARI's wider research program for enhancing the performance of leadership staff groups.

This research explored the quality of military leadership when, at the home post or station of a unit's assignment, leaders prepared their units for deployment to combat. The research applied current theory to test predictions about the unit conditions that influence whether and how the competence of home station leadership impacts on the performance of units in simulated combat at the CTCs. Evidence supported predictions that unit members' support of their leader influences the relationship between leadership competence and unit performance.

The sponsor for the research presented in this report is the Center for Army Leadership, U.S. Army Command and General Staff College, Fort Leavenworth, Kansas. Research is conducted under a Memorandum of Agreement between the U.S. Army Command and General Staff College and ARI dated 15 November 1990, subject: "Program of Research in Support of the Center for Army Leadership." The research presented in this report was initiated under a 1987 Memorandum of Agreement between the same parties.

EDGAR M. JOHNSON
Director

THE IMPACT OF LEADER COMPETENCE AND PLATOON CONDITIONS ON PLATOON PERFORMANCE IN SIMULATED COMBAT EXERCISES

EXECUTIVE SUMMARY

Requirement:

This research concerns the quality of the leadership shown by leaders when, at the home post or station of unit assignment, they prepare their units for deployment to combat. The research examines the influence of unit conditions on the relationship between home station leadership competence and the performance of units in simulated combat. Examination of the joint effects of leadership and unit conditions can potentially identify factors that are critical to the design or implementation of interventions for improving the development and effectiveness of leaders.

Procedure:

Fiedler and Garcia's (1987) cognitive resource theory (CRT) outlines specific organizational conditions that facilitate the impact of a leader's intellectual or cognitive capabilities on group outcomes. This research tested CRT predictions for combat platoon leaders and platoon sergeants. It was predicted that the relationship between home station leadership and platoon performance varies as a function of (1) unit members' support for their leader, and (2) the leader's stress with the superior.

Questionnaires were administered to the members of 69 combat platoons--platoon leaders (PLs), platoon sergeants (PSs), squad leaders (SLs), and squad members (SMs)--about 2 to 4 weeks prior to a platoon's deployment for training at one of the U.S. Army's Combat Training Centers (CTCs). Responses to these pre-exercise questionnaires measured the home station leadership competence of PLs and PSs. Questionnaire responses also produced measures of PL and PS experience, a leader's stress with the immediate superior, and member support for the leader. After having returned to their home stations, the members and the company commander of a platoon assessed platoon effectiveness in the missions undertaken during the CTC training. Median split and moderated regression analyses were used to test the predictions.

Findings:

Evidence supported predictions for PSs that member support influences the relationship between leadership competence and unit performance. Accordingly, the home station leadership competence of PSs was more strongly associated with platoon CTC performance when the platoon members were more cohesive or had a stronger sense of efficacy. Results did not support predictions that stress from superiors influenced the relationship between platoon performance and leadership quality.

Utilization of Findings:

Findings generally support the current emphasis on developing and maintaining the cognitive capabilities of individual leaders. They add that the impact of a leader's capabilities can be greater for units that are cohesive or have other organizational properties supportive of strong leadership. This suggests that interventions oriented to such properties as unit cohesion can potentially facilitate the expected payoffs from leader education, training, and development.

THE IMPACT OF LEADER COMPETENCE AND PLATOON CONDITIONS ON PLATOON PERFORMANCE IN SIMULATED COMBAT EXERCISES

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INTRODUCTION

In its program of research on determinants of Army unit effectiveness, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) examined home station conditions prior to a unit's deployment for combat training. Four domains of unit conditions were investigated: individual characteristics of unit members, unit training, organizational factors, and leadership. The research sought to determine how variables in the four domains accounted for unit combat effectiveness as measured by accomplishment of training missions during realistic simulations of combat at the Army's Combat Training Centers (CTCs). Determination of how variables in the four domains interact with, moderate, or otherwise jointly account for performance effectiveness was considered important for developing interventions that maximize the contribution of any single variable to unit preparedness for combat performance.

Fiedler and Garcia (1987) advanced cognitive resource theory (CRT) largely to account for the contributions of leaders' cognitive resources--"intellectual abilities, technical competence, and job-relevant knowledge obtained by formal training or experience in the organization (p. 2)"--to organizational performance. CRT, thus, potentially provides a framework for identifying conditions important to the influence of one factor investigated in the determinants project: the leadership abilities of unit leaders.

The general argument of CRT is that the leader's cognitive resources contribute to organizational performance only when conditions are favorable to that leader's influence. CRT indicates that three conditions are critical to the influence of a leader's resources on organizational tasks that are relevant to the resources. These conditions are (1) a directive style by the leader; (2) member (subordinate) support for a leader; and (3) stress in the relationship between a leader and the leader's boss.

In CRT, a leader's capabilities impact on group outcomes when the leader is directive. Directiveness is reflected in behaviors that shape or focus activities toward the accomplishment of the outcomes. Such activities include making plans, communicating plans, and telling the group how to enact plans. Member support indicates subordinates' willingness and ability to carry out their leader's directions. High member support thus serves to facilitate application of leadership capabilities on organizational performance.

In contrast, stress interferes with leaders' abilities to use their resources to impact unit performance. Stress, especially interpersonal stress between leaders and their bosses,

diverts leaders' resources from dealing with task demands and toward managing the source of their stress. For this reason, Fiedler and Garcia argue that leader intelligence and competence should not correlate with unit performance for leaders who have stressful relationships with their bosses.

CRT draws a distinction between abilities acquired by experience and abilities more purely representing a leader's cognitive capabilities. That is, leaders develop with experience abilities for efficiently handling difficult situations. CRT argues that when well learned through experience, such performance abilities are less susceptible to effectiveness under conditions of stress. Unlike more fluid cognitive resources, therefore, experience and the abilities acquired through it remain correlated with group effectiveness even under conditions of higher boss stress.

In presenting CRT, Fiedler and Garcia used summaries and secondary analyses of earlier research to provide support for the theory, and subsequent empirical research testing CRT is relatively minimal given the theory's recency. The available research (e.g., Vecchio, 1990; Murphy, Blyth, & Fielder, 1992) supports most consistently the hypothesized effects of leader directiveness. In addition to the small amount of independent research, hypotheses in CRT do not appear to be entirely consistent with other theories of leadership. One example is CRT's hypothesis that stress disables use of intellectual capabilities. This hypothesis seems contradictory to the problem-solving perspective of leadership, which argues that leader cognitive capacities are especially relevant in dealing with ill-defined situations (Mumford & Connelly, 1991). Thus, use of CRT may provide needed evidence about the theory as well as help to identify unit conditions that are important for programs intended to insure the optimal contribution of leadership skills to unit effectiveness.

ARI's determinants research measured leadership abilities using questionnaire items which described tasks performed by leaders. The tasks were selected based on the framework of leadership competencies promoted by U.S. Army doctrine (Headquarters, Department of the Army, 1990) for leader development. This framework identifies nine competencies: communication, supervision, teaching and counseling, soldier-team development, technical and tactical proficiency, decision making, planning, use of available systems, and professional ethics.

In the determinants research, the questionnaires were administered to the members of Army infantry units before the units deployed from their home stations to a CTC for training. The questionnaire measured the pre-deployment leadership task performance of the platoon leader and platoon sergeant who were, respectively, the senior commissioned officer and senior

non-commissioned officer in a platoon. Platoons are the smallest infantry units that are both typically led by a commissioned officer and assigned missions in CTC exercises. By design two CRT variables, member support and boss stress, were measured. Based on CRT, we hypothesized:

(1) The relationship between platoon performance and leadership competence is stronger under conditions of higher as opposed to lower member support.

(2) The relationship between leadership competence and platoon performance is stronger under conditions of lower, as opposed to higher, boss stress.

(3) Experience correlates with unit performance for leaders who report stressful relationships with their superiors.

METHOD

Subjects

Questionnaires were administered to the members of 69 infantry battalions, the platoon leader (PL) and platoon sergeant (PS) prior to training in CTC exercises. From the pre-exercise administration, responses were obtained from 54 PLs, 59 PSs, 168 squad leaders (SLs), and 1060 squad members (SMs). The number of respondents reporting themselves as SLs ranged from one to six per platoon, with a mean of 2.4. The number of SMs obtained per platoon ranged from two to 28, with a mean of 15.4.

After CTC training exercises, members of 58 platoons responded to a questionnaire which assessed platoon performance. Sampling plans and respondent loss produced some variation in the numbers and types of platoon members obtained per platoon. Post-exercise questionnaires were obtained from 49 PLs and 41 PSs. An average of about two SLs was obtained for a platoon. SMs were sampled in 32 platoons, with an average of about four SMs per platoon. The company commanders (CCs) of 14 of the possible 20 companies also responded to the post-exercise questionnaires. These CCs provided ratings of 42 of the sampled platoons.

Procedure

ARI researchers administered pre-exercise questionnaires at a unit's home station. An administration session typically included the members and leaders sampled from a single company, with each respondent individually completing a questionnaire. These pre-exercise questionnaires included items on all domains examined in the determinants project. They also yielded the specific measures of the independent and moderator variables used

here: PL and PS leadership competence, PL and PS experience, PL and PS stress with their superior, and member support.

Two to four weeks after the pre-exercise data collection, the platoons deployed as part of their larger organizations to an Army CTC (the National Training Center or the Joint Readiness Training Center). CTC training involved engaging brigade- or battalion-size units (and their subordinate elements, to include platoons) in successive combat operations (or missions) which were designed to be highly realistic simulations of combat. Simulation realism is intended to insure training rigor and, in addition, to allow the Army to obtain information for enhancing the readiness of the overall force.

Two-to-four weeks after a unit had returned to its home station from a CTC, ARI researchers again administered questionnaires to obtain ratings of the performance effectiveness of platoons during the CTC exercises. Post-exercise questionnaires were individually completed by the leaders and members of a platoon assembled as a group. Questionnaires were administered to CCs in individual sessions.

Measures

Platoon performance. Post-exercise questionnaires presented a list of the missions that a platoon could have undertaken during the CTC exercises. Platoon members and CCs used a four-level scale of demonstrated "training level" to rate a platoon on each mission that it had actually performed. The four levels and the scale values assigned to them were as follows: "trained" (4), "needs a little training" (3), "needs a lot of training" (2), and "untrained" (1).

Measures were computed separately for the CC and the members of a platoon. The CC measure was computed as the average of the CC's rating of a platoon's performance across missions at a CTC. The platoon-member measure was based on the ratings made by the members sampled for a platoon. The platoon-member measure was formed by computing, for each platoon member, the average of that individual's ratings of its platoon's performance on CTC missions. These scores were then averaged separately for the SMs and for the SLs in a platoon, thereby, resulting in one rating score for all SMs and one score for all SLs. The scores for SMs, SLs, PL, and PS were again averaged to form the platoon measure of platoon performance.

Leadership competence. As part of the pre-exercise questionnaire, the PL and PS in a platoon rated each other, and the SLs rated each of the PL and PS for their leadership performance during past tactical exercises. Questionnaire items had been designed to describe tasks that fit with the competency definitions in the Army's framework for leader

development and with research findings (Steinberg & Leaman, 1990a; 1990b) on the tasks actually performed by leaders (see Tremble & Alderks, 1991; Tremble, 1992 for further background on the leadership measures). From the overall pool of tasks in the questionnaire, we selected seven that appeared to describe, most directly, a use of cognitive capabilities, that is, a job knowledge, planning, or decision-making capability. Table 1 lists the items selected to measure leadership competence.

Table 1
Leader Competence Scale

1. Knows army tactics and war fighting.
2. Plans and conducts platoon level training. [a]
3. Plans for alternative courses of action.
4. Makes changes to plans when there are changes in the situation.
5. Makes use of available resources to accomplish the mission.
6. Plans what needs to be done by when, and by which elements of the platoon.
7. Figures out how to accomplish the task when he has only been given the objective.

[a] This item was rated uniquely for PL and was not included for the PS.

Performance of the leadership tasks was rated on a five-alternative scale of performance quality. The scale values and their anchors were as follows: "best of all" (5), "excellent" (4), "good" (3), "fair" (2), and "poor" (1). The extreme anchors for these scales were chosen to offset a frequent pattern in research on military leadership: highly positive and skewed distributions of members' ratings of their leader's leadership. It was anticipated that "favorable" anchors would encourage use of the entire range of the scale. It was also anticipated that the extremity of the most positive scale value, "best of all", would discourage cavalier use. Each rater's ratings of a leader were averaged. This yielded the PL's and PS's rating of the leadership competence of each other. The averages of the SLs in a platoon were again averaged to form the SL measures of PL and PS leadership competence.

Leader experience. In the pre-exercise questionnaire, PLs and PSs reported how long they had been on active duty in the Army. PLs responded on a 10 alternative scale that increased in four-month intervals from "0-3 months in service" to "36 or more months in service". PSs also responded on a 10 alternative scale; however, the shortest alternative was "less than a year", and the remaining nine alternatives increased in 2-year intervals from "1-2 years" to "17+ years". For purposes of analysis, the alternatives were viewed as forming a 10-step scale, and the alternatives were assigned values ranging from 1 (shortest time in Army) to 10 (longest time in Army).

Boss stress. PSs and PLs completed a five-item scale (Table 2) assessing their stress with their immediate superior. The PL was the immediate superior of the PS, and the CC was the immediate superior of the PL. Three of the five items were taken from Potter and Fiedler (1981), and the other two were composed for the current scale. Before averaged to form the five-item scale, responses to the items were reverse-coded so that responses indicating lower stress received higher scores.

Table 2
Boss Stress Scale

1. (My superior) is constantly changing the directions he gives to me.
2. (My superior) expects me to do too much in too little time.
3. (My superior) becomes unpleasant with me when he is under pressure.
4. (My superior) does not tell me what he expects from me.
5. (My superior) shows favoritism within the platoon.

Member Support. In CRT, member support reflects the subordinates' willingness and ability to carry out their leader's directions. Group cohesion and platoon efficacy measures were used to operationalize member support.

SMs' responses were used to form the measures of member support. As grouped for this research, most of the followers of a PL or PS were SMs so that their responses best represented the support of a leader's subordinates. Use of SMs' responses also reduced the method variance common to the independent and other moderator variables as all other variables were measured by responses from SLs, PSs, and PLs.

Table 3 presents the platoon efficacy and the cohesion scale items. The five-item platoon efficacy scale measured SM beliefs about their platoons' overall capability for effective performance across platoon task domains. The efficacy scale was developed for this study.

Group cohesion was measured in terms of the bonding or attachments among SMs in a platoon. The four-item cohesion scale was derived from a larger scale measuring the instrumental and affective bonds among the peers in a military unit (Siebold & Kelly, 1988a, 1988b).

Table 3
Member Support Measures

Platoon Efficacy Scale

1. Does a good job in garrison.
2. Does a good job in the field.
3. Is able to accomplish any mission it is given.
4. Is ready for combat at this time.
5. Will perform well at the JRTC/NTC.

Group Cohesion Scale

1. The squad members in this platoon trust each other.
2. The members in this platoon really care about each other.
3. The squad members in this platoon pull together to get the job done.
4. The squad members in the platoon work well together as a team.

Analysis

Two methods were used to test hypotheses. These analyses were run separately for the PL and the PS as the target leader.

First, for each hypothesis tested, median scores were used to divide platoons into more favorable (higher member support; lower boss stress) or less favorable (lower member support; higher boss stress) moderating conditions. For favorable and unfavorable platoon conditions, correlations were computed between leadership resources (competence and experience) and platoon performance. Differences between correlations were assessed using Fisher's Z transformation.

Second, hypotheses were tested using moderated regression analysis (Cohen & Cohen, 1983). Platoon performance was regressed hierarchically by (A) leader resources (leader competence or experience); by (B) the moderating conditions (member support or boss stress); and then by the interaction term (A x B). Significant variance in platoon performance explained by the addition of the interaction (A x B) term provided evidence that platoon conditions moderated the influence of leader resources on organizational performance.

RESULTS

Summary of Variables Measured

Table 4 presents coefficient alpha for scales, summary statistics, and correlations among measured variables.

Scale Reliabilities. Cronbach's coefficient alpha was used to assess the internal consistency of multiple item scales. Reliability coefficients for all scales were satisfactory, ranging from α=.86 to α=.96. Reliability coefficients were not computed for performance ratings because the training missions differed across platoons. Platoons serve different functions in combat, and, therefore, trained under the circumstances exercising those functions.

Summary Statistics. The possible range of scale responses were from one to five, except for platoon performance which had a response range from one to four. The scale means for constructs representing platoon conditions were consistently above the midpoint (i.e., mean from 3.43 to 3.96), but demonstrated adequate variance to permit median split analysis (i.e., standard deviation from .51 to .93).

The distribution of PLs' and PSs' experience warrant further discussion. PLs' reports of their Army tenure demonstrated a normal appearing distribution across all 10 alternatives. The mean time that PLs spent in the army was "20 to 23 months in service", with a standard deviation of about 8.8 months.

Unlike PL experience, PSs' reports of Army tenure were not distributed evenly across response alternatives. Rather, PS reports were negatively skewed and were clustered among the longer service intervals, with 66% of the PSs at 13 or more years of service (category 8 on the ten-alternative scale). Mean Army experience for PSs was represented by the category "13 to 14 years in service" with a standard deviation of about 3 years.

Table 4
Correlation Matrix for All Variables

	m	sd	1	2	3	4	5	6	7	8	9	10	11	12
1. PS competence (PL)	3.71	1.02	.94											
2. PS competence (SL)	3.38	.90	.40** (51)	.96										
3. PL competence (PS)	3.76	.78	.25 (41)	.13 (46)	.93									
4. PL competence (SL)	3.43	.81	.19 (51)	.31* (58)	.46** (46)	.96								
5. PS tenure in army	8.02	1.52	-.41** (42)	-.15 (48)	.08 (58)	-.24 (48)	-							
6. PL tenure in army	6.39	2.17	.03 (53)	-.03 (52)	.02 (41)	.12 (52)	-.05 (43)	-						
7. PS stress with PL	3.96	.93	.43** (42)	.29 (47)	.33** (58)	.30* (47)	-.12 (59)	-.04 (42)	.87					
8. PL stress with CC	3.62	.85	-.01 (52)	-.14 (51)	.03 (41)	.07 (51)	.04 (42)	-.06 (53)	.20 (41)	.86				
9. SM cohesion	3.43	.55	.32* (52)	.31* (58)	.06 (56)	.15 (58)	-.13 (59)	-.01 (53)	.21 (57)	-.29* (52)	.93			
10. SM collective efficacy	3.90	.51	.29* (52)	.26* (58)	.08 (56)	.17 (58)	-.28* (59)	-.07 (53)	.20 (57)	-.23 (52)	.71** (69)	.90		
11. Performance (member)	3.21	.32	.12 (51)	.50** (56)	.16 (45)	.32** (56)	-.13 (47)	-.20 (52)	.20 (46)	.00 (51)	.31* (57)	.24 (57)	-	
12. Performance (CC)	3.20	.43	.20 (38)	.35** (39)	.15 (32)	.39* (40)	-.25 (34)	.35* (39)	.30* (33)	-.16 (38)	.33* (40)	.43** (40)	.34* (40)	-

Note. Cronbach's alpha for scale reliabilities in bold located on the diagonal. Source of rating in parentheses.
PL = Platoon leader, PS = Platoon sergeant, SL = Squad leaders, SM = Squad members, CC = Company commander
* $p < .05$, ** $p < .01$

Differences in Resources and Performance

Table 5 presents means and standard deviations for the three moderator variables above and below the median. For all moderators, favorable conditions were rated significantly higher than less favorable conditions. Especially for boss stress, the variances for favorable conditions tended to be smaller than for less favorable conditions.

Table 6 presents descriptive statistics for leader resources and platoon performance for platoons above and below the median on the three moderator variables. Mean leadership competence ratings and mean platoon performance ratings tended to be higher for the more favorable conditions of member support and PS boss stress. This pattern was not observed for PL boss stress.

Despite these patterns, only six statistically significant differences for leader resources and platoon performance were found for median comparisons. These six differences showed no consistent pattern as they were distributed across ratings of platoon performance and leadership competence, across different raters, and represented three of the four possible moderating conditions.

Table 5
Means of Median Splits Representing Favorable and Unfavorable Platoon Conditions

	Favorable Condition		Unfavorable Condition			
	m	sd	m	sd	t	t sig
PS Boss stress	4.74 (25)	.31	3.39 (34)	.65	10.63	p<.001
PL Boss stress	4.29 (27)	.41	2.93 (26)	.80	7.72	p<.001
SM Group cohesion	3.81 (36)	.35	2.96 (33)	.36	11.81	p<.001
SM Platoon efficacy	4.29 (36)	.24	3.57 (33)	.44	10.28	p<.001

Note. Higher ratings denote less stress. Number of subjects in parenthesis

Correlations Among Variables

The correlations among variables (Table 4) were, at most, moderately strong, except for the relationship between member support variables of platoon efficacy and cohesion (r = .71). The overall pattern suggests, therefore, that the measures of the CRT variables were adequately independent for hypothesis testing.

Table 6

Mean Platoon Performance, Mean Ratings of Leadership, and Mean Leader Experience for Favorable and Unfavorable Platoon Conditions

	Low PL Stress			High PL Stress			T-test	
	Mean	St.d	n	Mean	St.d	n	t	T sig
Measure of Platoon Performance								
Group rating of performance	3.19	.33	26	3.18	.30	25	-.19	ns
CC's rating of performance	3.14	.39	19	3.17	.42	19	.25	ns
PL competence (PS rating)	3.82	.78	20	3.85	.76	21	.14	ns
PL competence (SL rating)	3.46	.82	26	3.29	.73	25	-.78	ns
PL tenure in the army	6.44	2.42	27	6.42	1.90	26	-.04	ns

	Low SM Cohesion			High SM Cohesion			T-test	
	Mean	St.d	n	Mean	St.d	n	t	t sig
Measure of Platoon Performance:								
Group rating of performance	3.11	.34	29	3.30	.25	29	2.46	p<.05
CC's rating of performance	3.07	.39	21	3.33	.43	21	2.07	p<.05
PL competence (PS rating)	3.67	.68	28	3.86	.88	28	.92	ns
PL competence (SL rating)	3.43	.89	31	3.41	.74	31	-.05	ns
PS competence (PL rating)	3.54	.99	26	3.91	1.04	26	1.35	ns
PS competence (SL rating)	3.14	.85	32	3.65	.82	33	2.49	p<.05
PL tenure in the army	6.62	2.12	26	6.04	2.14	27	-.99	ns
PS tenure in the army	8.21	1.57	29	7.90	1.42	30	-.79	ns

	Low SM Efficacy			High SM Efficacy			T-test	
	Mean	St.d	n	Mean	St.d	n	t	t sig
Measure of Platoon Performance:								
Group rating of performance	3.14	.32	28	3.27	.30	30	1.61	ns
CC's rating of performance	3.08	.39	21	3.32	.44	21	1.84	ns
PL competence (PS rating)	3.69	.89	28	3.84	.67	28	.73	ns
PL competence (SL rating)	3.33	.92	31	3.50	.70	31	.74	ns
PS competence (PL rating)	3.50	1.11	26	3.96	.89	26	1.63	ns
PS competence (SL rating)	3.26	.81	32	3.53	.93	33	1.27	ns
PL tenure in the army	6.69	2.26	26	5.96	1.97	27	-1.25	ns
PS tenure in the army	8.45	1.35	29	7.67	1.54	30	-2.07	p<.05

	Low PS Stress			High PS Stress			T-test	
	Mean	St.d	n	Mean	St.d	n	t	t sig
Measure of Platoon Performance:								
Group rating of performance	3.30	.29	22	3.13	.34	24	1.92	ns
CC's rating of performance	3.30	.33	16	2.97	.35	17	2.78	p<.001
PS competence (PL rating)	4.12	.74	20	3.33	1.08	22	2.76	p<.001
PS competence (SL rating)	3.61	.78	21	3.26	.91	26	1.39	ns
PS tenure in army	8.29	1.53	34	7.80	1.41	25	1.28	ns

PL = Platoon leader, PS = Platoon sergeant, SL = Squad leaders, SM = Squad members, CC = Company commander

For the alternative performance measures (ratings made by the CC and ratings made by platoon members) stronger correlations might have been expected. The small proportion shared variance between these performance measures suggests differences either in the perceptions or in the response tendencies of the different raters. Given the correlation magnitudes (r = .34), the alternative measures were not combined; rather, they were entered into separate analyses. [1]

Hypotheses for Leadership Competence

Member support. Hypothesis 1 stated that the relationship between leadership competence and platoon performance is stronger for conditions of high member support as opposed to low member support. For PSs or PLs, there were eight possible median comparisons between leader competence (two raters) and performance (two raters) under conditions of higher and lower member support (two measures--cohesion and platoon efficacy). Table 7 displays the median comparisons for member support.

Results partially supported the first hypothesis for the PS. First, the magnitude of all eight correlations for PSs with high member support was stronger than the corresponding correlations for low support condition. Significant differences were found between three of those correlations. Additionally, six positive and statistically significant correlations between PS competence and platoon performance existed for conditions of high member support; whereas, only one was found for low support conditions.

Results of the moderated regression analyses for the PS are presented in Table 8. Of the eight analyses conducted, three yielded significant interaction terms indicating that PS competence and member support jointly accounted for platoon performance. The significant interactions were found for the

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[1] While these correlations were not strong and suggested only moderate association between CC and platoon member ratings, other data suggest a pattern of association among platoon performance ratings. That is, after the completion of CTC training, platoon performance ratings were also made by the observer-controllers (OCs) of platoons. OCs monitored platoon performance and provided training feedback during the CTC exercises. OCs' ratings were not used in these analyses because very few were available (n = 21). However, both CCs' and members' ratings of platoon performance correlated significantly with OCs' ratings (r = .50 and r = .41 respectively).

Table 7
Correlations Between Leader Competence and Platoon Performance for Favorable and Unfavorable Platoon Conditions

	Collective Efficacy		Group Cohesion		Leader Stress	
PLATOON SERGEANT ANALYSIS						
SL Ratings of PS Competence with:	High	Low	High	Low	High	Low
Group rating of performance	.60** (29)	.34* (27)	.64** (29)	.30 (27)	.46* (24)	.51** (21)
CC rating of performance	.32 (19)	.29 (21)	.50* (21)	.09 (19)	.37 (16)	.14 (17)
PL Rating of PS Competence with:						
Group rating of performance	.23 (25)	-.05 (26)	.38[a] (26)	-.21 (25)	-.07 (21)	.00 (20)
CC rating of performance	.44[a] (18)	-.15 (20)	.36[a] (21)	-.25 (17)	-.12 (14)	-.15 (18)
PLATOON LEADER ANALYSIS						
SL Ratings of PL Competence with:	High	Low	High	Low	High	Low
Group rating of performance	.36* (23)	-.02 (22)	-.04 (23)	.22 (22)	.51**[b] (21)	-.24 (19)
CC rating of performance	.26 (15)	.06 (17)	-.09 (17)	.36 (16)	.33 (16)	-.05 (15)
PS Rating of PL Competence with:						
Group rating of performance	.50**[a] (29)	.17 (27)	.44** (29)	.21 (27)	.33 (26)	.30 (24)
CC rating of performance	.36 (19)	.45* (21)	.65** (19)	.14 (21)	.50* (18)	.25 (19)

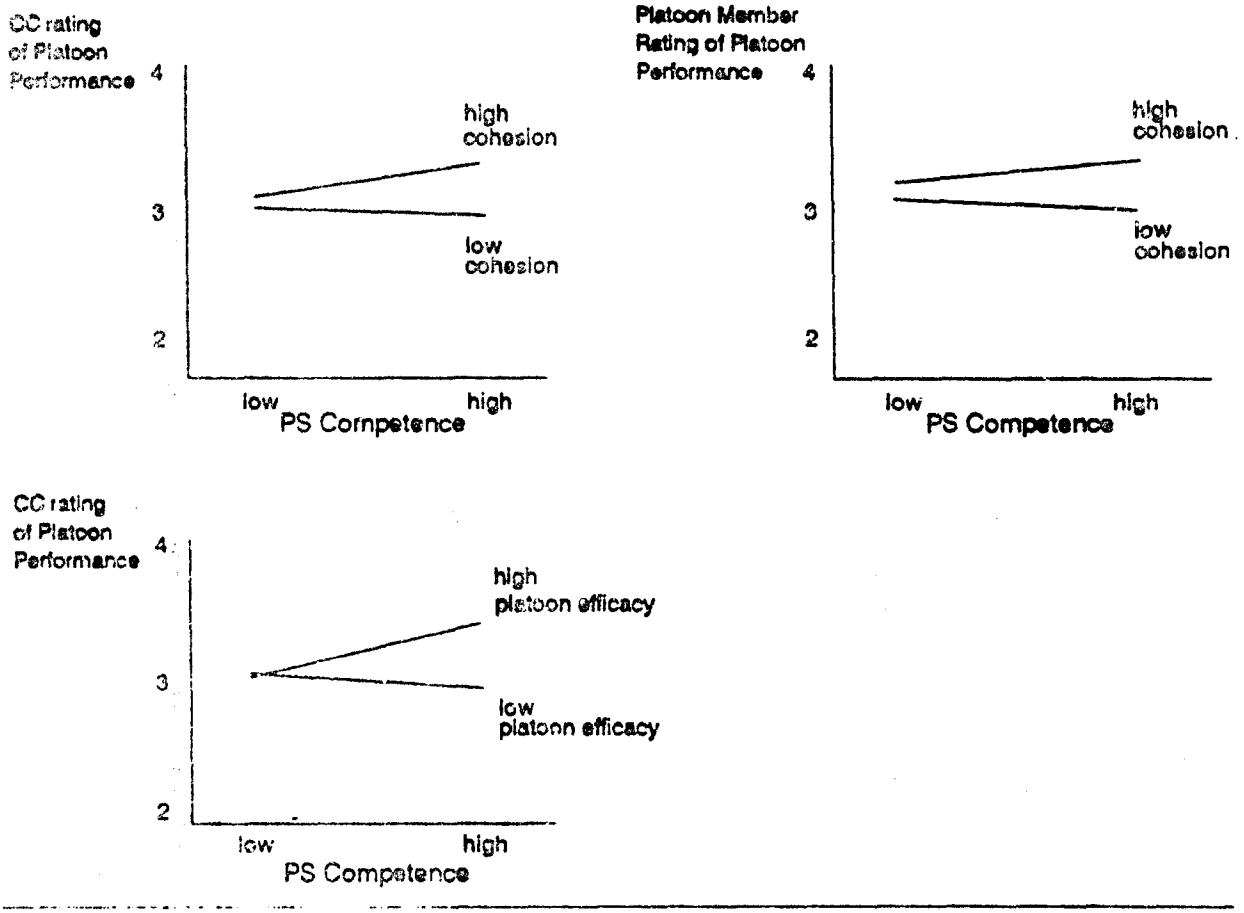
PL = Platoon leader, PS = Platoon sergeant, SL = Squad leaders, SM = Squad members, CC = Company commander

[a] significant difference between correlations ($p \leq .05$)

[b] significant difference between correlations, opposite of prediction ($p \leq .05$)

* $p \leq .05$, ** $p \leq .01$

Figure 1
The Interaction between PS competence and member support



same three conditions that produced significant differences for correlations for platoons above and below the median. Figure 1 illustrates these interactions and shows that high PS competence led to superior platoon performance only when conditions of high member support existed. Thus, moderated regression analyses corroborated results of the median analysis in offering partial support for Hypothesis 1 for the PS.

Table 8

Moderated Regression Results: The Interaction of Platoon Sergeant Competence with Platoon Conditions on Platoon Performance

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PS Leader Competence Rated by the Squad Leader:

Predicting Platoon Member's Rating of Platoon Performance

n=45	R^2	ΔR^2	n=56	R^2	ΔR^2	n=56	R^2	ΔR^2
PS Competence (A)	.25**	-	PS Competence (A)	.25**	-	PS Competence (A)	.25**	-
Stress (B)	.26**	.01	Cohesion (B)	.28**	.03	Efficacy (B)	.26**	.01
A X B	.30**	.04	A X B	.28**	0	A X B	.26**	0

Predicting Company Commander's Rating of Performance

n=32	R^2	ΔR^2	n=40	R^2	ΔR^2	n=40	R^2	ΔR^2
PS Competence (A)	.12*	-	PS Competence (A)	.12*	-	PS Competence (A)	.12*	-
Stress (B)	.16*	.04	Cohesion (B)	.17*	.05	Efficacy (B)	.28**	.15**
A X B	.17	.01	A X B	.24*	.07	A X B	.29**	.01

Leader Competence Rated by the Platoon Leader:

Predicting Platoon Member's Rating of Performance

n=41	R^2	ΔR^2	n=51	R^2	ΔR^2	n=51	R^2	ΔR^2
PS Competence (A)	.01	-	PS Competence (A)	.01	-	PS Competence (A)	.01	-
Stress (B)	.03	.02	Cohesion (B)	.08	.07	Efficacy (B)	.07	.06
A X B	.04	.01	A X B	.20*	.12**	A X B	.12	.05

Predicting Company Commander's Rating of Performance

n=32	R^2	ΔR^2	n=38	R^2	ΔR^2	n=38	R^2	ΔR^2
PS Competence (A)	.02	-	PS Competence (A)	.04	-	PS Competence (A)	.04	-
Stress (B)	.10	.08	Cohesion (B)	.17*	.13*	Efficacy (B)	.26**	.22**
A X B	.11	.01	A X B	.35**	.17**	A X B	.37**	.11**

PL = Platoon leader, PS = Platoon sergeant, SL = Squad leaders, SM = Squad members, CC = Company commander

* $p \leq .05$, ** $p \leq .01$

Table 9

Moderated Regression Results: The Interaction of Platoon Leader Competence with Platoon Conditions on Platoon Performance

PL Competence Rated by the Squad Leader:

Predicting Company Commander's Rating of Performance

n=37	R^2	ΔR^2	n=40	R^2	ΔR^2	n=40	R^2	ΔR^2
PL Competence (A)	.13*	-	PL Competence (A)	.15*	-	PL Competence (A)	.15*	-
Stress (B)	.14	.01	Cohesion (B)	.21*	.06	Efficacy (B)	.32*	.17*
A X B	.14	0	A X B	.21*	0	A X B	.33*	01

Predicting Platoon Member's Rating of Performance

n=50	R^2	ΔR^2	n=56	R^2	ΔR^2	n=56	R^2	ΔR^2
PL Competence (A)	.03	-	PL Competence (A)	.03	-	PL Competence (A)	.03	-
Stress (B)	.03	0	Cohesion (B)	.11	.08	Efficacy (B)	.08	.05
A X B	.05	.02	A X B	.11	0	A X B	.08	0

PL Competence Rated by the Platoon Sergeant:

Predicting Company Commander's Rating of Performance

n=31	R^2	ΔR^2	n=32	R^2	ΔR^2	n=32	R^2	ΔR^2
PL Competence (A)	.02	-	PL Competence (A)	.02	-	PL Competence (A)	.02	-
Stress (B)	.06	.04	Cohesion (B)	.18*	.16*	Efficacy (B)	.16*	.14*
A X B	.07	.01	A X B	.18	0	A X B	.16	0

Predicting Platoon Member's Rating of Platoon Performance

n=40	R^2	ΔR^2	n=45	R^2	ΔR^2	n=45	R^2	ΔR^2
PL Competence (A)	.10*	-	PL Competence (A)	.10*	-	PL Competence (A)	.10*	-
Stress (B)	.10	0	Cohesion (B)	.16*	.05	Efficacy (B)	.15*	.05
A X B	.10	0	A X B	.16*	0	A X B	.16*	.01

PL = Platoon leader, PS = Platoon sergeant, SL = Squad leaders, SM = Squad members, CC = Company commander
* $p \leq .05$, ** $p < .01$

Whereas some support for hypothesis 1 was found for PSs, support was not found for PLs (see Table 7). When platoon members rated platoon performance, three of the four correlations between PL competence and platoon performance were positive and statistically significant for PLs with higher support, but only one of these was significantly greater than the corresponding correlation for lower member support. When CCs rated platoon performance, however, no trend was observed. Moreover, none of the moderated regression analyses produced a significant interaction term between PL leadership competence and either support condition (see Table 9).

Boss stress. Hypothesis 2 stated that leader competence is more strongly related to performance for conditions of low boss stress than for conditions of high boss stress. Table 7 presents the results of the median split analyses for the PS and the PL. The results did not support hypothesis 2. Correlations between PS competence and platoon performance did not significantly differ under conditions of low ($-.15 \leq r \leq .51$) and high boss stress ($-.12 \leq r \leq .46$). Further contrary to hypothesis, correlations for PL competence were positive and were generally stronger for conditions of high stress ($.33 \leq r \leq .51$) than low stress ($-.24 \leq r \leq .25$). For PLs, two of the high stress correlations were statistically significant, and one was significantly greater than the corresponding low stress condition. Moderated regression analysis produced no support for the expected interaction between stress and leader competence for either the PS (see Table 8) or the PL (see Table 9).

Hypothesis for Leadership Experience

Hypothesis 3 stated that leader experience correlates with performance under conditions of high leader boss stress. Results of the median split analyses, summarized in Table 10, offered only weak support the third hypothesis. For PSs, all correlations between experience and platoon performance were nonsignificant. For PLs, one statistically significant correlation was obtained. This correlation indicated the expected positive relationship between PL experience and CCs' ratings of platoon performance under conditions of high stress. Moderated regression analyses (Table 11) revealed no significant interactions between stress and experience for either PSs or PLs. Overall, results did not support the hypothesized relationship between leadership experience and unit performance under stressful leadership conditions.

Table 10

Correlations Between Platoon Sergeant Experience and Platoon Performance for Conditions of High & Low Stress with Platoon Leader

Correlations of Platoon Sergeant Experience (Tenure of PS in Army) with:	Low Boss Stress	High Boss Stress	Fisher's Z
Group's rating of performance	-.13 (24)	-.04 (22)	-
CC's rating of performance	-.25 (15)	-.23 (18)	-
Correlations of Platoon Leader Experience (Tenure of PL in Army) with:	**Low Boss Stress**	**High Boss Stress**	**Fisher's Z**
Group's ratings of performance	-.03 (26)	-.11 (25)	-
CC's rating of performance	.19 (19)	.57** (19)	1.14, ns

PS = Platoon Sergeant, PL = Platoon Leader, CC = Company Commander, * $p < .05$, ** $p < .01$

Table 11

Moderated Regression Results: The Interaction of Leader Experience with Boss Stress on Platoon Performance

The Interaction of Platoon Sergeant Experience and Boss Stress on Performance.

Platoon Member Ratings of Performance

n=46	R^2	ΔR^2
PS experience (A)	.02	-
PS stress with PL (B)	.05	.03
A X B	.05	.00

Company Commander Ratings of Performance

n=33	R^2	ΔR^2
PS experience (A)	.08	-
PS stress with CC (B)	.15	.07
A X B	.16	.01

The Interaction of Platoon Leader Experience with Boss Stress on Performance

Platoon Member Ratings of Performance

n=51	R^2	ΔR^2
PL experience (A)	.05	-
PL stress with CC (B)	.05	.00
A X B	.08	.03

Company Commander Ratings of Performance

n=38	R^2	ΔR^2
PL experience (A)	.11*	-
PL stress with CC (B)	.12	.01
A X B	.16	.04

PL = Platoon leader, PS = Platoon sergeant, SL = Squad leaders, SM = Squad members, CC = Company commander

* $p < .05$, ** $p < .01$

DISCUSSION

The purpose of this research was to explore conditions under which leaders bring their leadership resources to bear on organizational performance. Two Army leadership positions, the PSL and the PL, were examined according to hypotheses generated from cognitive resources theory (CRT). Support for CRT predictions was limited to the moderating effects of member support on the relationship between PSs' leadership competence and platoon performance in combat exercises. Member support did not influence the relationship between PL competence and platoon performance. Results also failed to support predictions that stress in the relationship between a leader and the leader's immediate superior moderates the effects of leader competence or experience on platoon performance.

In accounting for these findings, there are several possibilities. This research failed to measure a critical variable in CRT--leader directiveness. In CRT, leader directiveness is the vehicle through which leaders' cognitive resources impact on group performance. The failure to control for directiveness may have masked the "true" relationship that existed between leadership resources and platoon performance.

While this failure cannot be dismissed, another important consideration involves the leadership resources measured in this investigation. This effort measured leaders' resources in terms of competence in performing leadership tasks prior to platoon performance in the combat training exercises. Such a measure presents two issues for research on CRT.

One is the types of abilities captured by a measure of task performance. In addition to a leader's intellectual abilities, the job specific knowledge gained through experience would likely contribute to task competence. Competence in task performance may also require interpersonal skills. As such, the measure used here was likely a composite of the types of leadership resources--intellectual, technical, and experience-- put forth by CRT. It should be noted, however, that CRT broadly defines cognitive resources to include cognitive abilities that are influenced by experience (p. 2; Fiedler & Garcia, 1987):

> This term [cognitive resources] refers to the intellectual abilities, technical competence, and job-relevant knowledge obtained by formal training or experience in the organization (p.2).

Moreover, there has been little consistency in past research in the measurement of cognitive resources, with measures including general intelligence (Vecchio, 1990; Fiedler & Garcia, 1987) and technical competence (Murphy, Blyth, & Fiedler,1992).

If competence and experience have different effects on leaders' performance across conditions, then selecting leader competence as the targeted cognitive resources construct is problematic if it is confounded with experience. Correlations, however, do not provide evidence of a strong positive relationship between ratings of leadership competence and leaders' reported experience (r=-.41 to r=.12)[2].

The second issue stems from the timing of measurement and the types of skills for which CRT attempts to account. This issue could account for the limitation of support to the PS. The measure of leadership competence was based on perceptions of leadership performance while the units were preparing to participate in simulated training exercises. These exercises took place about two-four weeks later. The measure, thus, represented abilities displayed prior to the exercises. CRT attempts to account for direct effects and, moreover, the direct effects of only those competencies "required" by the group task. Thus, hypotheses from CRT would apply in this investigation under two conditions: (1) the competencies measured in an earlier performance setting carry into the later performance setting and (2) the competencies measured in the earlier setting are required by group performance in the later setting.

Consideration of the traditional roles of PLs and PSs suggests that the PS's leadership competencies are most likely to meet the two conditions just identified. The traditional view is that PSs (and their subordinate non-commissioned officers) have responsibility for conducting those activities that train and develop the individual and collective capabilities necessary for unit readiness. When units later deploy to field activities, NCOs continue to maintain group conditions, but commissioned officers take charge of unit performance. This view suggests the possibility of relatively greater continuity for PSs, than for PLs, in the leadership competencies that are relevant to and required for both unit preparation and later unit performance in field activities. With this greater continuity, the leadership competence of PSs as measured here may be more appropriate for testing CRT.

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[2] The correlation between PS experience and the PL's rating of the PS's competence was significant and negative (r=-.41, p<.01). All other correlations between either PL or PS competence and their respective tenure in the army were not significant.

The determinants data may not have been fully appropriate for testing the effects of boss stress and, thereby, may have contributed to the failure to support the hypothesized effects for PSs as well as for PLs. For the PSs investigated, the range of the obtained data on experience (third hypothesis) was restricted. As mentioned earlier, the distribution of the PSs' tenure of Army service was negatively skewed so the 66% of the sample PSs fell into the three highest categories of Army experience measured. This was accompanied by a relatively smaller variance for PSs' experience as compared to PLs' (see Table 4). Also, the measurement of boss stress prior to and outside of the training exercises may have worked against the boss stress hypotheses for both the PSs and the PLs. We suspect that compared to the other pre-exercise conditions, high levels of boss stress would more likely be an "acute" condition. That is, organizations dependent on all of their elements for effectiveness are not likely to tolerate chronically high levels of boss stress. This raises the possibility that the levels of pre-exercise boss stress were not severe (see Table 5) or had been addressed. With the latter, pre-exercise measurements of boss stress may not have reliably described the stress that influenced leader performance during the exercises.

CRT's hypotheses about stress imply interaction effects between the level of interpersonal stress and certain cognitive capabilities (as represented by intelligence, experience, etc.) open to the effects of stress. CRT further assumes that boss stress disrupts the subordinate leader's ability to apply the relevant cognitive capabilities. This assumption deserves examination since other theories (e.g., Mumford & Connelly, 1992) indicate that the problem-solving capabilities and the cognitive competencies of leaders are crucial to performance in novel, complex, and demanding performance domains such as those at CTCs.

The methods used to test CRT need to carefully examine the processes with which stress impacts on leaders' effective use of cognitive abilities, technical abilities, and experience. For instance, stress with one's superior may impact the quality of information exchange between the subordinate leader and his superior and the resulting cognitive burden on the subordinate leader. More specifically, it is often superiors in hierarchically ordered organizations who are knowledgeable of situational demands, who structure performance requirements for subordinate elements, and who communicate this information to subordinates. Boss stress, as measured in this study, would

impact on the quality of information exchange between leaders by reducing goal clarity and introducing conflicting information. By measuring or controlling mediating processes, stronger findings may emerge concerning the effects of stress on leaders' use of cognitive resources.

Partial support was found for the facilitating effects of members support on the PS's ability to impact unit performance. In accounting for the effects of member support, CRT focuses attention to the effects of member support on the leader and on the leader's behavior. The passage below reflects this focus and highlights how member support increases a leader's perception of situational control and frees him/her to direct cognitive resources toward the group task.

> The most important element of situational control is the group members' support. We feel a lot more comfortable and relaxed when we know we can depend on our subordinates. It is difficult to feel relaxed if we cannot be sure that our orders and directions are carried out. If subordinates are unreliable, the leader is likely to worry about subordinates' activities and to supervise their work closely. (Fiedler & Garcia, 1987, p. 52).

However, research should explore and control for alternative explanations for the effects of member support. For example, member support may impact the quality of the implementation of a leader's plans as much as the quality of the plans made by the leader. Indeed, group conditions potentially substitute for the behaviors or functions of leaders within a group (Kerr & Jermier, 1978).

It is also important to recognize the leaders may actively attempt to create favorable group conditions. By doing so, leaders can make optimal use of both their own and their group members' competencies. In this regard, Hackman and Walton (1986) indicated that an important outcome of effective leadership is the enhancement of the group members' ability to work effectively in future task situations. Future research should explore alternative processes among member support, leader behavior, and group performance to more fully understand relationship between leadership and group performance.

Findings were consistent for two different measures of platoon performance--a measure based on ratings made by the CCs and a measure based on ratings by the platoon members themselves. Consistent patterns were obtained despite an almost disturbingly small commonality in the two measures (r=.34). Consistency of results for measures with such small commonality, nevertheless, argues against dismissal of results for the platoon members' findings as simply an artifact of a halo or bias in self ratings.

Implications, both practical and theoretical, can be drawn from this research. For practice, the findings indicate that leaders' cognitive capabilities have positive effects on unit performance, and that utility may be gained from programs targeting the development of those capabilities. The results also underscore the general premise of CRT that organizational conditions can moderate the impact of a leader's cognitive abilities. In this study, member support was indicated to be one such condition. Thus, the results caution that the payoffs of programs aimed at developing leader cognitive skills may be fully realized to the extent that they also consider the organizational context in which the targeted skills will be applied.

Other implications are more theoretical, and some have been identified elsewhere (Fiedler & Garcia, 1987; Vecchio, 1990). First, there is a need for clear differentiation among types of cognitive capabilities since all types may not be similarly affected by organizational conditions. Second, CRT accounts for the impact of cognitive resources that are relevant to the group or organizational task. Test of CRT, therefore, requires prior specification and verification that the types of resources investigated are indeed relevant. At present, CRT contains no clear guidelines for resource relevance, and this reduces the testability of the theory. Third, CRT concerns direct affects. This limits the theory to those circumstances in which one can reasonably expect direct effects. Not all group performance settings are either so simple or straightforward in this regard. This limitation is unfortunate since our results suggest that the relevance of a leader's resources could vary with leadership position and with the role requirements of a position. Fourth, CRT's hypotheses are not necessarily congruent with other theories. We have already discussed this with respect to boss stress. This also applies to member support. Over a long period of time, it is not clear that groups would sustain the motivation needed for higher performance levels if their leaders persisted in a highly directive style and in directly imposing their solutions for implementation (Hersey & Blanchard, 1982; Blades, 1986). Finally, although CRT highlights the importance of existing environmental conditions such as member support, leadership effectiveness can also be examined in light of what leaders do to create a favorable organizational context.

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